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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/604,870
Filing Date: August 22, 2003
Appellant(s): JOSHI ET AL.

Daniel F. Nesbitt
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed December 14, 2006 appealing from the Office action mailed February 10, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,280,185	Martin	7-1981
US2004/0024501	Muehl et al.	2-2004
6,321,983	Katayanagi et al.	11-2001
5,968,107	Vogan et al.	10-1999

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-20, 12, 14-17, and 19-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Martin (US 4280185A), in view of Muehl et al. (US20040024501A1), and in further view of Katayanagi et al., (US 6321983B1).

a. Per claim 1, Martin teaches an apparatus for recording, storing, updating, and retrieving operating, maintenance and repair information relating to individual components of turbine engines, including at least one information storage device permanently deployed on at least one individual component (64, figure 1), identification information about the engine component (30-35, figure 1), at least one data register having data storage capabilities referenced by stored identification information of at least one part and a parameter (column 8, lines 17-21), wherein the information storage device is accessible for retrieving recorded and stored information (column 4, lines 37-42). Martin does not explicitly teach that the one individual component identifies the at least one part of the entire engine. However, Martin does explicitly teach that the storage devices include information on the individual engine modules as discussed at column 3, lines 38-58. Muehl teaches individual component tagging of engine parts for maintenance related reasons. Muehl does explicitly teach identifying at least one part of a component of an engine with upgradeable data storage registers that specifically store

identification information about an individual part of the larger component (page 3, [0030]-[0034]). Furthermore, the motivation for Muehl to individually identify at least one part of the engine component is the same as the motivation to identify the individual engine modules by identification in the Martin system, namely to improve maintenance of complex systems such as engine turbines. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to store identification information about an individual part of the larger component in the system of Martin, as taught by Muehl, in order to improve maintenance of the engine as contemplated by both Martin and Muehl.

b. The combination of Martin and Muehl does not teach storing information on individual parts of the components making up the turbine engine. However, storing more data or detailed information on individual parts of a larger component would have been obvious to one of ordinary skill in the art at the time of the invention. The combination of Martin and Muehl identify that storing information on the components is beneficial to track the components and store maintenance and repair histories. The same reasoning also applies to why it would have been desirable for one of ordinary skill in the art at the time of the invention to modify the system to include more detailed information on the part level, rather than just the component. In part, advances in technology, such as the development of smart cards and RFID tags have made the storage of data easier, while the capacity of such devices has increased greatly. These advances, along with the obvious desire to store information regarding maintenance and repairs, would have been obvious to one of ordinary skill in the art at the time of the invention. Katayanagi

teaches a general method for managing life cycles of replaceable products that reflects both the advances in technology and the requisite desire to store individual part information associated with components (see generally, column 10, lines 17-52). It would have been obvious to one of ordinary skill in the art, at the time of invention, to store information on individual parts of the components making up the turbine engine in the system taught by the combination, as more detailed information is both desirable and made easier by advances in technology, as evidenced in an example by Katayanagi.

c. Per claim 2, Martin teaches that the information is updated by an engine control system (column 4, lines 8-13).

d. Per claim 3, Martin teaches periodically storing the data (column 2, lines 10-15).

e. Per claim 4, Martin teaches recording the "on-time" of a component, which necessarily includes updating when the component is stopped to compute the time (column 8, lines 13-16).

f. Per claim 5, Martin teaches adding to the storage device (column 8, lines 17-18).

g. Per claim 6, Martin teaches storing information over the life of the component (column 8, lines 17-21).

h. Per claim 7, Martin teaches storing information permanently (column 8, lines 17-21).

i. Per claim 8, Martin teaches storing information over the life of the component (column 8, lines 17-21).

j. Per claims 9 and 10, Martin teaches that the LTU can be mounted on the engine (column 3, lines 45-46),

k. Per claim 12, Martin teaches anti-tampering measures (column 8, lines 30-32).

l. Per claim 14, Martin teaches that the information storage device can be mounted on the engine (column 3, lines 45-46).

m. Per claim 15, martin teaches that the information storage device can be mounted off the engine (column 3, lines 45-46).

n. Per claim 16 and 17, Martin teaches that the storage device can be located off the engine and information is supplied from a remote location (column 3, lines 45-46, line 59-68).

o. Per claim 19, Martin teaches that the storage device can be queried by an outside unit (column 4, lines 40-42), where the data can be used by people to ensure that contractual obligations are met.

p. Per claim 20, Martin teaches an apparatus for electronically recording, storing, updating, and retrieving operating, maintenance and repair information relating to individual components of turbine engines, including at least one information storage device permanently deployed on at least one individual component (64, figure 1), identification information of at least one life limited part of the engine component (30-35, figure 1), at least one data register having data storage capabilities for life limited parts referenced by stored identification information of at least one life limited part and a

parameter (column 8, lines 17-21), wherein the information storage device is accessible for retrieving recorded and stored information (column 4, lines 37-42). Martin does not explicitly teach that the one individual component identifies the at least one part of the entire engine and that the data register is upgradeable. However, Martin does explicitly teach that the storage devices include information on the individual engine modules as discussed at column 3, lines 38-58. Muehl teaches individual component tagging of engine parts for maintenance related reasons. Muehl does explicitly teach identifying at least one part of a component with upgradeable data storage registers that specifically store identification information about an individual part of the larger component (page 3, [0030]-[0034]). Furthermore, the motivation for Muehl to individually identify at least one part of the component is the same as the motivation to identify the individual engine modules by identification in the Martin system, namely to improve maintenance of complex systems such as engine turbines. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to store identification information about an individual part of the large component in the system of Martin, as taught by Muehl, in order to improve maintenance of the engine as contemplated by both Martin and Muehl.

q. The combination of Martin and Muehl does not teach storing information on individual parts of the components making up the turbine engine. However, storing more data or detailed information on individual parts of a larger component would have been obvious to one of ordinary skill in the art at the time of the invention. The combination of Martin and Muehl identify that storing information on the components is beneficial to

track the components and store maintenance and repair histories. The same reasoning also applies to why it would have been desirable for one of ordinary skill in the art at the time of the invention to modify the system to include more detailed information on the part level, rather than just the component. In part, advances in technology, such as the development of smart cards and RFID tags have made the storage of data easier, while the capacity of such devices has increased greatly. These advances, along with the obvious desire to store information regarding maintenance and repairs, would have been obvious to one of ordinary skill in the art at the time of the invention. Katayanagi teaches a general method for managing life cycles of replaceable products that reflects both the advances in technology and the requisite desire to store individual part information associated with components (see generally, column 10, lines 17-52). It would have been obvious to one of ordinary skill in the art, at the time of invention, to store information on individual parts of the components making up the turbine engine in the system taught by the combination, as more detailed information is both desirable and made easier by advances in technology, as evidenced in an example by Katayanagi.

r. Per claim 21, Martin teaches storing the information permanently (column 8, lines 17-21).

s. Per claim 22, Martin teaches periodically storing the data (column 2, lines S. 10-15).

t. Per claim 23, Martin teaches recording the "on-time" of a component, which necessarily includes updating when the component is stopped to compute the time (column 8, lines 13-16).

u. Per claim 24, Martin teaches a method for recording, storing, updating, and retrieving operating, maintenance and repair information relating to individual components of turbine engines, including providing at least one information storage device permanently deployed on at least one individual component (64, figure 1), storing identification information about at least one part of the engine component (30-35, figure 1), providing at least one data register having data storage capabilities and referencing each data register with stored identification information of at least one part and a parameter (column 8, lines 17-21), and retrieving recorded and stored information (column 4, lines 37-42). Martin does not explicitly teach that the one individual component identifies the at least one part of the entire engine and that the data register is upgradeable. However, Martin does explicitly teach that the storage devices include information on the individual engine modules as discussed at column 3, lines 38-58. Muehl teaches individual component tagging of engine parts for maintenance related reasons. Muehl does explicitly teach identifying at least one part of a component of an engine with upgradeable data storage registers that specifically store identification information about an individual part of the larger component (page 3, [0030]-[0034]) and that the data register is upgradeable (page 4-5, [0049]). Furthermore, the motivation for Muehl to individually identify at least one part of the engine component is the same as the motivation to identify the individual engine modules by identification in the Martin

system, namely to improve maintenance of complex systems such as engine turbines. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to store identification information about an individual part of the larger component in the system of Martin, as taught by Muehl, in order to improve maintenance of the engine as contemplated by both Martin and Muehl.

v. The combination of Martin and Muehl does not teach storing information on individual parts of the components making up the turbine engine. However, storing more data or detailed information on individual parts of a larger component would have been obvious to one of ordinary skill in the art at the time of the invention. The combination of Martin and Muehl identify that storing information on the components is beneficial to track the components and store maintenance and repair histories. The same reasoning also applies to why it would have been desirable for one of ordinary skill in the art at the time of the invention to modify the system to include more detailed information on the part level, rather than just the component. In part, advances in technology, such as the development of smart cards and RFID tags have made the storage of data easier, while the capacity of such devices has increased greatly. These advances, along with the obvious desire to store information regarding maintenance and repairs, would have been obvious to one of ordinary skill in the art at the time of the invention. Katayanagi teaches a general method for managing life cycles of replaceable products that reflects both the advances in technology and the requisite desire to store individual part information associated with components (see generally, column 10, lines 17-52). It would have been obvious to one of ordinary skill in the art, at the time of invention, to

store information on individual parts of the components making up the turbine engine in the system taught by the combination, as more detailed information is both desirable and made easier by advances in technology, as evidenced in an example by Katayanagi.

w. Per claim 25, Martin teaches periodically storing the data (column 2, lines 10-15).

x. Per claim 26, Martin teaches recording the "on-time" of a component, which necessarily includes updating when the component is stopped to compute the time (column 8, lines 13-16).

y. Per claim 27, Martin teaches a method for electronically recording, storing, updating, and retrieving operating, maintenance and repair information relating to individual components of turbine engines, including providing at least one information storage device permanently deployed on at least one individual component (64, figure 1), storing identification information of at least one life limited part of the engine component (30-35, figure 1), providing at least one data register having data storage capabilities for life limited parts and referencing each data register with store identification information of at least one life limited part and a parameter (column 8, lines 17-21), and retrieving recorded and stored information (column 4, lines 37-42). Martin does not explicitly teach that the one individual component identifies the at least one part of the entire engine and that the data register is upgradeable. However, Martin does explicitly teach that the storage devices include information on the individual engine modules as discussed at column 3, lines 38-58. Muehl teaches individual

component tagging of engine parts for maintenance related reasons. Muehl does explicitly teach identifying at least one part of a component with upgradeable data storage registers that specifically store identification information about an individual part of the larger component (page 3, [0030]-[0034]) and that the data register is upgradeable (page 4-5, [0049]). Furthermore, the motivation for Muehl to individually identify at least one part of the engine component is the same as the motivation to identify the individual engine modules by identification in the Martin system, namely to improve maintenance of complex systems such as engine turbines. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to store identification information about an individual part of the larger component in the system of Martin, as taught by Muehl, in order to improve maintenance of the engine as contemplated by both Martin and Muehl.

z. The combination of Martin and Muehl does not teach storing information on individual parts of the components making up the turbine engine. However, storing more data or detailed information on individual parts of a larger component would have been obvious to one of ordinary skill in the art at the time of the invention. The combination of Martin and Muehl identify that storing information on the components is beneficial to track the components and store maintenance and repair histories. The same reasoning also applies to why it would have been desirable for one of ordinary skill in the art at the time of the invention to modify the system to include more detailed information on the part level, rather than just the component. In part, advances in technology, such as the development of smart cards and RFID tags have made the storage of data easier, while

the capacity of such devices has increased greatly. These advances, along with the obvious desire to store information regarding maintenance and repairs, would have been obvious to one of ordinary skill in the art at the time of the invention. Katayanagi teaches a general method for managing life cycles of replaceable products that reflects both the advances in technology and the requisite desire to store individual part information associated with components (see generally, column 10, lines 17-52). It would have been obvious to one of ordinary skill in the art, at the time of invention, to store information on individual parts of the components making up the turbine engine in the system taught by the combination, as more detailed information is both desirable and made easier by advances in technology, as evidenced in an example by Katayanagi.

aa. Per claim 28, Martin teaches periodically storing the data (column 2, lines 10-15).

bb. Per claim 29, Martin teaches storing information over the life of the component (column 8, lines 17-21).

Claims 11 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Martin, Muehl, and Katayanagi as applied to claims 1-20, 12, 14-17, and 19-29 above, and further in view of Vogan et al. (US005968107A).

a. Per claims 11 and 18, the combination teaches the invention as explained in the rejection of claims 1 and 10. The combination does not teach predicting future maintenance requirements from the data. In the field of diagnostic and maintenance data gathering, parameter trending of engine or other components is commonly known

and used. One such system is disclosed by Vogan. Vogan teaches using the stored data from a component to predict the future maintenance requirements of that component before a failure occurs, in order to minimize downtime or repair time of the component (column 1, lines 57-67). It would have been obvious to one of ordinary skill in the art, at the time of invention, to use the stored parameter information in the system of the combination to predict future maintenance requirements, as component trending is well known and practiced in the art, as evidenced by Vogan.

(10) Response to Argument

The arguments begin by discussing some confusion within the rejection that has arisen because of the addition of prior art references throughout prosecution. In order to clarify the issues the art in used in the rejection will be explained in more detail. Martin discloses an identification system that includes a life tracking unit (28) that includes stored information on the components of the engine. This life tracking unit can be located on the engine itself and can be considered a tag. Muehl et al. disclose a more detailed tagging system for a "complex article" and uses an aircraft, along with it's engine, as and example. What is important to note about Muehl is they include a tag for each of the plane, the engine, and then components of the engine. The tag for the plane includes information on the plane and parts of the plane, see figure 3, item 320. The tag for the engine includes information on the engine and parts of the engine, see figure 4, item 405. The tag for each component of the engine only includes information on the component (i.e. it does not contain information on the parts of the component). But the overall concept of storing part information for a component in the component's

tag is present in Muehl, it is just that the component isn't disclosed as being a turbine engine component. In Muehl the component is the engine itself. Katayanagi et al. discloses a system for managing the life cycle of a product. Their invention includes tagging the product and the tag storing information about not only the overall product, but also the parts of the product. Katayanagi et al. does not limit the use of this life cycle management system to any specific field of endeavor other than a manufactured product, which would include components of a turbine engine.

In considering Appellant's arguments, through paragraph (3) there is agreement with Appellant's assumption that the Examiner's position is that Martin and Muehl "do not teach individually or in combination storing information on individual parts of the components making up the turbine engine." This is because Katayanagi et al. is cited for teaching storing information on individual parts of the components.

Beginning in paragraph (4) and continuing through paragraph (12), Appellant begins to present a novel argument that since the breadth of the claims and what the prior art did teach was not fully understood by the examiner initially, that the examiner is guilty of using hindsight in determining where to search when performing an updated search. Instead of arguing that the reason to combine Katayanagi et al. with Martin and Muehl, Appellant seems to be suggesting that the Examiner performed and "invalid search". It is inescapable that some hindsight is used in performing a prior art search, but what the law doesn't allow is impermissible hindsight in combining references in a rejection. It must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes

into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In this instance, the combination of Katayanagi et al. with Martin and Muehl is proper because one of ordinary skill in the art at the time the invention was made would have made such modification because it would provide for life cycle management of the products as well as an evaluation of whether a product or parts thereof should be recycled or destroyed as stated on lines 12-16, on column 14, of Katayanagi et al. Martin already discloses a life tracking system. Muehl et al. disclose a more detailed tracking system that includes a hierarchy where the tag of the plane has information on sub-parts or the plane (3055), the engine on the plane has a tag that includes information of sub-parts of the engine (405), and an engine component tag. It could easily have been argued that extending the inclusion of sub-part information to the engine component tag like what is already present in the engine and plane tag would be obvious to one of ordinary skill in the art over Martin and Muehl alone. Katayanagi et al. provides the teaching that ANY articles of manufacture can be tagged for life cycle management (i.e. life tracking as in Martin) and that these tags include parts information of the article of manufacture, or in this case engine component. It is clear that one of ordinary skill in the art at the time the invention was made would find it obvious to include the detailed information of Katayanagi et al. in the component tag taught in Muehl to provide the more detailed tracking provided by Katayanagi et al.

What Appellant seems to be trying to argue with respect to Katayanagi et al. is that the reference is not an analogous art. It has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the particular problem that Appellant tries to solve is that the information provided in the tags of the prior art is not sufficient. More detailed information is provided to track the turbine components for life cycle management, including maintenance. This is the exact same problem addressed by Katayanagi et al. Katayanagi et al. teaches storing the life cycle of a product and its associated parts including the maintenance history (see line 57, on column 4, through line 3, on column 5). Clearly, Katayanagi et al. is pertinent to the particular problem addressed by the instant invention.

Appellant also suggests in paragraph (8) on page 14:

"*Basically, the Examiner argues that inventive steps used by the prior art should be inputted upon the latest prior art to advance the technology, and to arrive at the Applicant's invention. In other words, the prior art should be able to "invent" new prior art by adding new inventive steps onto old art. This is clearly not what the law provides or allows".*

This statement contradicts itself. The first sentence states the form that a 35 USC 103 rejection takes and this is exactly what the examiner does in the rejections. Limitations from the prior art can be combined as long as there is sufficient motivation or reason for one of ordinary skill in the art to do such. However, the second sentence attempts to summarize the first sentence but doesn't mean the same thing. The second sentence

states that new inventive steps are being added onto old art. That is not what the rejection does. The rejection combines that which is old only. Appellant has not argued that the limitations of the claims are not taught in the cited prior art, only that the combination is improper, so it is not clear what "new inventive steps" are being created.

Appellant's arguments in paragraphs (9) and (10) again bring up the argument that hindsight was improperly used to search the prior art. This has already been addressed above and will not be repeated.

Appellant's argument in paragraph (11) is not very clear but seems to take issue with the obvious statement of the rejection. The reasons to combine the cited prior art have been discussed above. Appellant also argues that if the instant invention was obvious in view of Muehl's teaching than Muehl would have disclosed this in their specification. This statement seems to suggest that Appellant feels that if one prior art reference does not disclose all the limitations then the invention cannot be obvious and combined with another reference. The Appellant argues Muehl separately without taking into account what the cited references as a whole disclose when combined. Katayanagi et al. teaches storing part information of a tagged component. Muehl teaches the tag on the component of the turbine engine. Martin discloses the life tracking on a turbine engine. The reason to combine Katayanagi et al. with the other two is the more detailed information is beneficial for life tracking. This is benefit is repeatedly discussed in Katayanagi et al. and one of ordinary skill would know to combine Katayanagi et al. with Martin and Muehl so that their inventions would also benefit from the more detailed tracking data.

Appellant's arguments paragraph (12) assert that the only desire to store part information associated with components comes from Applicant's own disclosure. This statement is clearly erroneous since the disclosure of Katayanagi et al. specifically discloses this limitation (see lines 13-13, column 2; lines 38-42, on column 10; and the abstract).

Appellant summarizes his arguments related to the first rejection by stating that neither Martin nor Muehl disclose tracking information on a part of an engine component and that the combination with Katayanagi et al. is improper because Katayanagi et al. wasn't located in the turbine engine art. Appellant states that their invention was used as a blueprint for the search and that there is not a proper reason to combine or "cobble" together the teachings of the prior art. As stated above by the examiner, the rejection relies on Katayanagi et al. for the teaching of storing parts information of a component. The argument by the Appellant that the search was improper is not an argument based in any law. If the invention were a special screw used on a turbine engine it would not be proper to search only the turbine art, one would also search the art related to screws in general. The argument stating that the is no reason to combine Katayanagi et al. with the other prior art because it is not from the turbine engine art is not convincing because it fails to recognize that prior art is analogous art if the problem being addressed is reasonably related. In this instance, the references are closely related by the problem being solved.

As per claim 16, Appellant argues that information stored on the information storage device is from a remote location. Martin discloses this limitation on lines 59-68,

on column 3. The information is delivered to the information storage device through remote engine mounted sensors. Remote location is a very broad term and has been given its broadest reasonable interpretation.

As per claims 11 and 18, Appellant again argues that there is no motivation to search beyond what the may be suggested by Martin, Muehl et al. or Katayanagi et al. This is not the law and motivation to combine is not restricted to only what Martin, Muehl et al., or Katayanagi et al. might suggest. It is also proper to consider what other prior art might suggest. Appellant also argues that only through impermissible hindsight through reading their specification would one consider searching for and combining the teachings of these references. If it were impermissible to search for Vogan based on the instant specification, how would it have been permissible to search for Martin, Muehl et al., or Katayanagi et al. after reading the specification? Impermissible hindsight is only an issue when there is not a proper motivation or suggestion to combine the prior art. In this instance, Vogon et al. provides for engine trending by monitoring engine parameters to predict or prevent engine problems. The motivation to combine Vogon et al. with the other references is that by collecting these engine parameters for trending engine failure can be prevented or predicted and this reduces downtime as disclosed on lines 30-33, on column 1, of Vogon et al. It is disclosed that downtime can be very expensive or costly and preventing this is widely recognized in the art as being a significant motivation. One of ordinary skill in the art at the time the invention was made would recognize this cost savings as being beneficial to the invention of Martin, Muehl et al. and Katayanagi et al.

In paragraph (2) of the arguments Appellant argues that if it would have been obvious to one of ordinary skill in the art to combine the references Martin or Muehl would have mentioned the teachings of Vogon et al. in their disclosure since they are presumably one of ordinary skill in the art. This argument basically states that 35 USC 103 is unnecessary since whenever someone invents something new, they will have disclosed all possible additional uses in any disclosure they provide. This isn't the law and the motivation to combine the references mentioned above is proper.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Brian J. Broadhead

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Thomas A. Black TAB

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SUPERVISORY PATENT EXAMINER